water for life

minister's forum on water

summary

ideas on the future of alberta's water

Alberta
GOVERNMENT OF ALBERTA

water for life

minister's forum on water

summary report of advice received

to
The Honourable Lorne Taylor
Minister of Environment
Government of Alberta

prepared by
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August 15, 2002

The Honourable Lorne Taylor
Minister of Environment
Government of Alberta
Room 423, Legislature Building
10800 - 97 Avenue
Edmonton, Alberta T5K 2B6

Dear Dr. Taylor,

I am pleased to forward this report which describes the range of ideas raised at the Minister's Forum on Water held on June 6 and 7, 2002.

Participants at the forum represented a wide range of perspectives on water management, and therefore raised a wide range of ideas and suggestions for your consideration. They were not asked to build a consensus about these ideas, and so the report describes many possible approaches. Discussion team reports at the forum reinforced that Albertans feel a water strategy is important, and that the provincial government must be the accountable leader in developing and implementing the strategy. Participants felt that the water strategy must be a compatible part of the government's sustainable development policies, and that it must be supported by regulations and guidelines. While there was wide acceptance that many water practices will have to change in the future, there was also recognition that many of the current policies and practices provide an important foundation for the future. Forum participants endorsed the government's efforts to create a strategy, and to help Albertans adapt to changes, but cautioned about the problems that could be created if the government were to tamper with allocation priorities, or existing safeguards.

Although each of the seven discussion teams at the forum focussed on different aspects of water management, they raised similar key ideas about what a water strategy must address. These key ideas are highlighted below:

A water management system that focuses on water basins

The provincial government must act as the leader and the accountable party in implementing a water management system focussed on each of the seven major water basins in the province. Within each basin, there is a need for:

- public information to help all residents be part of the solution
- stakeholder involvement in basin management plans
- benchmarks, criteria and monitoring to ensure aquatic ecosystem protection
- guidelines about the wise use of water within each basin, and
- reporting of trends, changes and concerns within each basin.

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Note: Water basin management was understood by forum participants to be part of a hierarchy of governance beginning with appropriate legislation and regulations, and including provisions for risk management.

A safe drinking water assurance program

The provincial government must work with municipalities, water utility operators and citizens to ensure safe drinking water for all Albertans. This will require an increased role for the provincial government and the regional health authorities in monitoring, providing technical advice and supporting improvements in drinking water supply where needed. The focus of this program should be small and medium-sized municipalities and private water systems. The forum participants did not resolve funding mechanisms but recognized that funding will be an important issue.

A long-term risk management approach

The provincial government must implement a long-term risk management approach to water supply and demand. The rights and obligations of licence holders within this approach must be clear. Several of the forum discussion teams raised the importance of full cost accounting to guide water management and allocation decisions. Forum participants also discussed how the "First in Time, First in Right" (FITFIR) principle might fit within long-term management but did not resolve this matter.

Assurance of water quality

The provincial government must ensure that Alberta's fresh water resources are not polluted or contaminated. This will require increased emphasis on monitoring and enforcement (particularly of emissions that could affect groundwater), and may require new regulations in the future.

Motivation of Albertans to use water wisely

The provincial government must motivate Albertans (industry, agriculture and private citizens) to use water wisely and place a higher emphasis on conservation. This will require the government to evaluate a range of approaches based on accepted criteria, policy and science.

Since you attended the forum and spoke with many of the participants, you will not be surprised to hear that they placed very high importance on participating and many have offered to be further involved in the development of a water strategy for Alberta. The following summary report illustrates the creativity and depth of conviction that forum participants brought to their task.

Sincerely,

Bill McMillan
Forum Moderator

executive summary

The seven discussion teams at the Minister's Forum on Water, held in Red Deer on June 6 and 7, 2002, reinforced the importance of the challenges identified through public consultation a month earlier. They strongly urged the provincial government to develop a water strategy and noted the need for all Albertans to improve their understanding of water resources and change the way water is used. Most discussion teams recommended that efforts be focussed on the seven water basins in Alberta (through basin plans, studies, reports and consultation).

Forum participants asked the provincial government to increase its commitment to water management, including the following requests:

- Encourage wise use of water
- Increase efforts to assure safe drinking water
- Protect water from contamination
- Develop a long-term risk management approach to supply and demand.

Forum participants also expressed a need for changes and suggested that the provincial government increase staffing and skills so more emphasis can be placed on monitoring, reporting and enforcement of conditions of surface and groundwater in the water basins.

Section 1 of this report summarizes the recommendations and advice that emerged from the forum. Section 2 (see page 11) summarizes the notes from each team discussion.

section 1 - recommendations and advice

purpose

The Minister's Forum on Water was an important step toward fulfilling the provincial government's commitment to develop a water management strategy for Alberta. It followed extensive consultation with Albertans which included public meetings, a web site and a telephone survey (see "Pooling Your Ideas," Alberta Environment, May 2002).

The forum involved over 100 Albertans who were invited to spend two days addressing the following:

- Clarifying priorities resulting from the public outreach and consultation phase
- Generating options to address priorities
- Identifying the roles of provincial governments, groups, industries and individuals.

The advice received from the forum will become an important reference for Cabinet, and for the cross-ministry team in the Alberta provincial government who will be charged with drafting a water strategy.

format

Forum participants were divided into seven discussion teams, each composed of people who would bring a diverse range of views to the table. The seven teams were each assigned one of the following themes for discussion: water conservation, water quality, drinking water, aquatic ecosystems, water supply, water and its role in the economy, or governance. The team members were asked to identify major decisions which the provincial government must address in a strategy, and to identify reasonable options the provincial government should consider. Participants were also asked to provide advice that would support good decisions and to note differences of opinion.

Each discussion team reported to the plenary on two occasions so all participants could see their progress and their thinking. There was also an open plenary discussion to encourage people to think more broadly about a strategy, without the constraint of being part of a team.

major recommendations that emerged during plenary sessions

Plenary reports from discussion teams confirmed that participants felt the themes chosen for discussion are important areas for the provincial government to focus on. Growing demand for water, increasing uncertainties of supply, and increasing concerns about environmental damage are major drivers that require Albertans to place more importance on the way they use water.

Although each discussion team addressed a separate topic, the teams reported similar preferences about desired actions. The following recommendations reflect the common preferences and perspectives reported in the plenary ***(listed in random order)***.

1. **There should be significant emphasis on education and involvement of both stakeholders and the public in water management planning and implementation**
   - Public and stakeholder involvement will be important to success. Success will be unlikely if there is not a significant effort to improve information and help people understand the consequences of activities that affect water quality and quantity.
   - The provincial government should implement a variety of ways to involve stakeholders (discussion team 7 described both advisory and delegated decision mechanisms).

2. **There should be significant emphasis on watershed planning and management**
   - Recent integrated approaches to watershed planning (e.g. South Saskatchewan Basin) are important and should be an integral part of a strategy (see summaries of reports from discussion teams 2, 4 and 6).
   - The provincial government should develop authoritative supply forecasts and demand management within basins for the long-term future. The government should also assess aquatic environments within basins and determine the water quantity and quality needed to maintain the aquatic environments.
   - Watershed planning should be integrated with land use decisions.
   - Public reporting of watershed conditions would increase public awareness of water issues in a way that would be immediate to those who live or work within a basin. "State of the Basin" reports could provide baseline information and describe trends and water use relationships in the basin.

3. **The provincial government must specifically define the quality and quantity of water required in natural water systems to ensure environmental sustainability and must ensure this allocation is maintained** (see team 4's summary report)
   - This will require improved identification of water quality and quantity requirements, habitat types, and habitat maintenance requirements–including sensitive aquatic environments.
   - Credible science to support these definitions is essential.

4. **The provincial government must ensure that Albertans are not exposed to unsafe drinking water** (see team 3's summary report)
   - A common, comprehensive definition of "safe drinking water" is required.
   - There must be a clear legal notation that drinking water (for human consumption) is the highest priority of water use.
   - There should be an increased role for both the provincial government and the regional health authorities in the assurance that municipal and private water supplies are safe. This will require that the respective roles of each are clarified and that investments be made in both skills and infrastructure.
   - Safe drinking water relies on multiple barriers to prevent contamination (e.g. supply, transmission, treatment, use) and includes protection of water quality within the watershed.

5. **Albertans must implement improved water conservation practices**
   - There is an urgent requirement to help Albertans understand the importance of water, the need to use it wisely, and the opportunities to improve our use of water.
   - The provincial government can use a variety of tools (see team 1's summary report) to help Albertans make important adjustments in the way we use water and to strengthen existing successful practices.

6. **The provincial government should continue to prevent pollution and contamination of water. Improved regulations, monitoring and enforcement are recommended** (see summary report from discussion team 2)
   - The provincial government should investigate means to stimulate innovation in industry and agriculture–including establishing regulatory requirements for the future that could not be met today.
   - There is particular concern about groundwater contamination.

7. **A long-term forecast of supply along with improved demand and risk management approaches are needed to ensure good management in the future** (see discussion team 5's summary report)
   - The provincial government should develop a supply forecast and an associated demand management strategy over the longer term, and should also develop standards of risk management within this projection.
   - Groundwater could be an important source of future water allocation and should therefore be inventoried.

8. **The provincial government must assure that "First in Time, First in Right" (FITFIR) allocations are secure, and yet must also improve allocation criteria and ensure flexibility to account for future needs and conditions** (see summary report from discussion team 6)
   - If some current uses are not appropriate, the provincial government should establish requirements for water use and inform licence holders. There may be a need to establish values that address fairness, ability to pay, highest value use, conditions for return of water, etc.

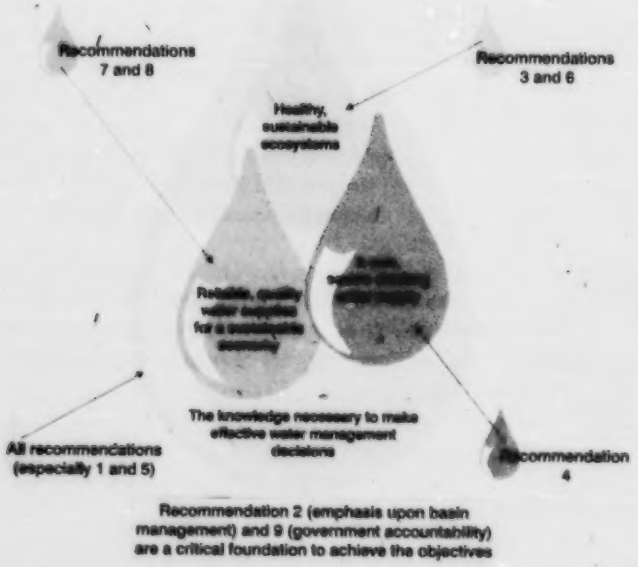
- Water transfers and a market for water rights is an important "re-balancing" mechanism, but there is concern that inequities could occur and that water could become a saleable commodity.
- Changes could affect individuals, sectors or the provincial economy and these implications must be carefully assessed.

9. The provincial government must be accountable for the safety and sustainability of water in Alberta. Increased staff and skills are essential to future success

- Despite concerns about cost and size of provincial government, most participants feel that the provincial government, especially the Departments of Environment and Sustainable Resource Development, will require more staff and more skills to effectively address water management for the long term.

how the recommendations are linked to strategic objectives

At the outset of the discussions of a water strategy, four objectives were announced (these objectives were confirmed through public consultation). The following diagram illustrates the inter-connected nature of the four objectives, and illustrates how the recommendations can be tied to the objectives. The recommendations of the forum also directly reflect the public advice gained in the previous stage of the water strategy consultation process.


Recommendations 7 and 8
Recommendations 3 and 6
Healthy, sustainable ecosystems
All recommendations (especially 1 and 5)
The knowledge necessary to make effective water management decisions
Recommendation 4
Recommendation 2 (emphasis upon basin management) and 9 (government accountability) are a critical foundation to achieve the objectives

options

Each discussion team identified options the provincial government could implement. The teams worked to create a wide range of options, without testing for consensus. The many options identified have been consolidated into the following eight categories for easy reference. These options are described in greater detail in the section 2 of this report - summaries of team discussions.

Category	Options Identified	Discussion Teams
Economic tools	Royalties, fees, incentives, financial penalties	1 and 6
Water basin management	Water basin plans, councils or advisory boards, inventories and studies, use criteria	2, 4, 5, 6 and 7
Risk management	Long-term assessment of supply and demand with risk curves	5
Improved drinking water safety	Partnership with municipalities, grants, regional management systems, infrastructure, technology, partnership with regional health authorities, full cost accounting, water pricing, education	3
User education and involvement	Public education, market tools that affect user behaviours, curriculum-based education, public reporting of trends, involvement in regional and provincial decisions	All
Environmental protection	Improved inventory of aquatic environments, water quality baseline measurements, improved monitoring, tougher regulation of discharges, more enforcement, more specific environmental requirements or standards	1, 2, 4 and 6
Supply management	Infrastructure, inventory, forecasting, storage, inter-basin transfer (in specific situations only), public-private partnerships	5 and 6
Allocation	Criteria for water use, net consumption guidelines, review/respect current allocations, allocation for drinking and sanitation, clear ground rules, review of current use to determine if inappropriate use occurs	3, 5 and 6

A separate report with the complete notes from team discussions is available on request from Alberta Environment.

cautions, concerns and dilemmas

During the discussions, a number of factors arose that are points of serious concern, disagreement, or uncertainty among the participants.

These points are listed below to help decision makers understand where unresolved concerns will be a factor as decisions are made.

Water allocation process

Many Albertans hold FITFIR priority to water rights and are concerned their priority could be at risk. Other Albertans see the need for more emphasis on determining the best use of water and establishing the required condition of the water when it is returned. The provincial government will have to resolve how to ensure water is not being misused, while maintaining the predictability and promise associated with FITFIR. (Discussion team 6 felt that a trading market is a significant part of the solution.)

Cost allocation

Everyone agrees that cost allocation must be fair, but the rules of fairness are not yet agreed upon. The provincial government must consider how much of the cost should be an increase in public expenditures. Many participants believe that more costs should be shifted to the water users (which could imply agriculture and industry since they are major users). The concept of "user pay," "polluter pay" and "full cost accounting" were mentioned. However, industry and agriculture representatives caution that these additional costs could affect their competitiveness or result in costs being passed along to consumers.

Aquatic environment allocation

Many participants think we have to recognize the environment as a water user. However, participants are unsure whether we currently have surplus water in most river basins, or whether we have an environmental shortage (and therefore could be harming aquatic environments).

Sustainable growth

Many participants feel future growth must be managed sustainably. It is essential that growth be supported within the carrying capacity of the water supply and the aquatic ecosystem. Participants had varying opinions about the best way to balance growth and sustainability.

Use of potable water for oil field injection

The injection of potable water into oil fields troubles many Albertans. Many feel this use is wasting a valuable resource. The oil industry feels this use of water provides continued economic benefit. This matter requires study.

Climate change

Will investment (private and public) and changes be necessary to reduce the risk of climate change (as outlined in the Kyoto agreement) or not? Some participants think this is critical to water supply in the future, while others feel this issue is peripheral to the water management discussion. Many wanted to focus on future uncertainty, regardless of one's perspective on "climate change."

Long-term benefits versus short-term costs

Many participants feel improved water management is critical to the future of our province. They are unsure, however, about how many changes have to be made quickly.

Many changes made immediately may force us into a limited number of priorities–and overlook the range of actions necessary in the long-term.

Inter-jurisdictional relationships

Some participants feel it should be made clear that there are many other players who will affect the future of Alberta water. The provincial government must consider the roles and demands of other governments as a water management strategy is developed, and must seek the partnership of other governments to share common water management objectives.

Inter-basin transfers

Most participants feel large scale transfers would not be feasible, economically or environmentally. However, many noted situations in which local transfers from one basin to an adjacent basin (especially closed diversions) might be a reasonable solution (there are current examples of this).

criteria

The following criteria describe concerns and preferences that should guide the provincial government's decision-making in developing a water strategy:

- Ensure decisions are consistent with other levels of government
- Ensure reliable and predictable funding
- Recognize water resources as assets
- Support stakeholder (any interested party) involvement
- Retain clear accountability and responsibility
- Open/transparent process
- Decisions must be credible with stakeholders
- Must have a way to implement the decisions
- Support watershed groups and approaches
- Support knowledge gathering/sharing
- Respect uniqueness of each water basin
- Ensure decisions are made with full knowledge of costs and benefits
- Stimulate collaborative solutions
- Encourage flexibility and adaptability
- Avoid duplication/waste
- Must be seen to be fair/equitable (e.g. appeal process)
- Must be fully integrated and sustainable to all species
- Enforceable and self-regulating
- Recognize potential for multiplier effect (partnerships, co-investment)
- Least cost to implement; highest benefit produced
- Data-based
- Must have measurable outcomes.

implementation advice

Discussion teams provided advice about how to implement changes successfully. The following points are indicative of the advice contained in their reports:

- The time frame for transition needs to be understood so adaptation can take place without stranding assets
- A water management strategy must allow users to predict water availability and must clearly describe regulatory expectations
- We need to transfer the benefits of efficiency to those who create efficiency gains
- Make sure all stakeholders are at the table, but that the stakeholder process does not become too costly in terms of time and administration
- Take advantage of the high interest from stakeholders and communities at this time
- Take advantage of what is already out there, focus on integrating the many efforts that are underway. Encourage sharing of data and information
- Use a quality management cycle (plan-do-act-check) and use an external audit process
- Keep the multi-stakeholder governance process open and transparent
- Challenge water users. Set targets and highlight best practices
- Keep the public informed; translate science and technology into accessible language and maintain personal contact with communities
- Provide adequate staff and resources to do the job well
- Keep it simple and interesting
- Develop a provincial public communication strategy to support this effort
- Provide better information to support curriculum in Alberta schools
- Work with the municipalities as partners in drinking water management
- Examine provincial grants to ensure they encourage the best water management approaches
- Involve the federal government in the change process and work together to remove barriers to success
- Social science needs as much attention as resource science
- Recognize the benefits of public-private partnerships for expertise, technical strength and funding.

assumptions and knowledge requirements

Throughout the forum, participants were asked to identify assumptions the decision makers must either make or study further. They also identified areas where more knowledge is needed.

Assumptions

The following list of assumptions is a compilation taken from the notes of the discussion teams. Each statement describes an assumption discussed by a team (these were not consensus items).

Decision makers may wish to review these assumptions to determine whether additional study or advice is needed:

- We may have extended droughts (or times of scarcity) in the future (no matter what the mechanisms of climate change turn out to be)
- The public, Minister and Cabinet will see the protection of the aquatic ecosystem as a priority
- People will have to change their ways and this will require attention to the process of change
- The need for changes in how we use water is urgent but not a crisis
- Current water rights will continue to be recognized
- Albertans have a birthright to safe drinking water that the provincial government is obliged to protect
- All surface water used for drinking should be treated to a drinking water standard
- Some present practices cannot continue without real harm
- Our water use is exceeding nature's ability to recharge the water supply in some areas; there will be greater pressure on aquatic ecosystems/wetlands, if we do not change
- Alberta can pass less water along to Saskatchewan in the future
- There will continue to be a supply of water for drinking and sanitation
- Water supply is not evenly distributed in Alberta.
- The major challenges noted in the Public Consultation Summary will be addressed by the strategy.
- Municipal government's authority/role will increase (with adequate funding)
- Difficult choices between growth and the limitations of our aquatic resources will need to be made
- Technological advances will make improvements but will not solve all problems
- Environmental conscience will increase among the general population
- Overall governance responsibility rests with the provincial government
- There will be long-term government support for a water strategy process.

Knowledge requirements

The following statements describe areas where participants feel greater knowledge is needed. These statements include areas where research is needed and areas where education or information dissemination is needed. Improvements in managing water wisely will require:

- Improved public information about aquatic ecosystems
- Improved public awareness of watershed management, including knowledge of what watershed they reside within, the hydrological cycle and the role of the public
- An assessment of the current status of the aquatic ecosystem
- A review of current practices (here and elsewhere) to determine what needs improvement
- Research and development of new technologies (efficiency of use, reduction of impurities added to effluent)
- User education about untreated water delivery systems

- Information to change public perceptions about the cost of providing treated water
- Predictive modelling to estimate impacts of changes to natural water systems
- Public information about the consequences of no action and the benefits of taking action
- Benchmark studies about water supplies, distribution, allocation, use and quality
- Definition of a healthy ecosystem, including the ecological functions for aquatic, terrestrial and groundwater systems
- Improved information about the aquatic environment's ability to assimilate substances that enter the system from effluents
- Better public understanding of the controls that are currently in place, and of current successful approaches.

monitoring progress toward implementing a provincial water strategy

Participants were asked to provide advice about monitoring implementation to ensure desired directions and results actually occur. Most discussion teams included monitoring ideas in their notes (discussion team 7, addressing governance, was particularly helpful in this area). Following are highlights of the monitoring recommendations:

- Establish a suite of indicators to monitor the aquatic ecosystem
- Establish and communicate the basis for measuring "good" basin management, so everyone will know how success will be measured (identify both specific measures by basin, and comparative measures used for all basins)
- Ensure annual reporting of progress toward four objectives (possibly a "State of the Environment" report, supplemented by "State of the Basin" reports)
- Ensure ongoing monitoring of drinking water safety through regional health authorities and environmental departments
- Establish both leading indicators (technology, training, communication) and lagging indicators (volume, quality, consumption)
- Use a water quality management cycle (plan-do-check-act)
- Use external monitoring or auditing to validate results
- Monitor the involvement and diversity of stakeholders involved; survey stakeholders about the appropriateness of involvement strategies.

evaluations

Participants evaluated their experience at the forum within a team setting. Their perceptions provide important information about the success of the forum–many new approaches were tried at this forum and it plays a key role in the formation of a water strategy. The evaluations indicate high satisfaction with most aspects of the forum, although there were concerns about the length of time used in the opening plenary and some frustration about working within specific assigned topics.

A summary of the evaluations is available from Equus Consulting Group Inc.

section 2 - summaries of team discussions

team 1 - water conservation

This team examined the need for improved water conservation practices in Alberta and determined that water conservation is an urgent priority. They noted "the provincial government must challenge Albertans and user sectors to establish and implement a water conservation ethic, target and actions as one element of a sustainable water strategy." They therefore identified the strategic decisions that the provincial government should address.

They then identified a range of tools the provincial government can use to motivate improved conservation practice. In reviewing the tools, the team identified positive and negative attributes of each to assist decision makers with their choice. The following ideas would have to be integrated with communications that provide users with better knowledge about the need for, and the benefits of, conservation.

Options (Tools)	Positive Attributes	Negative Attributes
Pricing or Royalties	• Will create a fund that can be dedicated to conservation • Price should reflect storage, treatment and delivery costs at least (no subsidies) • Price can be adjusted by volume of use	• Will be viewed as a tax • Could discriminate against certain sectors or users • Could divert dollars from other important investments • Could make people think of water as a commodity
Incentives	• Could increase buy-in (credits for using less)	• Could create additional costs • Could reward waste • What is the source of funds?
Tradeable Permits	• Long-term rights are respected • Would require a cap to encourage conservation • Low implementation cost	• Might lead to futures trading • No cap, no conservation • Difficult to account for future variations • Water aligns with **$$$**

Options (Tools)	Positive Attributes	Negative Attributes
Expropriation of Rights	• Would create results quickly • Removes the speculator	• This could be expensive • Potentially abuses individual rights • Rewards some users for not conserving
Regulation	• Effective in setting minimum requirements • Clarifies requirements • Motivates through fines and court action	• Costly and difficult to implement • Requires monitoring and enforcement • Can create conflict
Benchmarks (targets set by government)	• Encourages best management practices • Gives information to people (empowers)	• Costly to develop • Require regular updating • Who is the final judge?
Pilot Studies	• Allow trial balloons with minimum risk • Promote technical advances • Are driven by needs • Could involve communities and schools • Provide economic opportunity	• May take too long • Must be linked to a communication plan
Water Management Authorities	• Supports local control • Establishes clear responsibility and authority • Should involve all stakeholders • Long-term commitment required • Priorities are clarified when budget is allocated	• This could be costly • Must make sure the provincial government is reduced elsewhere • Getting all stakeholders involved is difficult • May require experts to interpret data • Subject to ups and downs of budget

The team identified criteria the provincial government should use in analyzing which options are best:

1. Impact on the river basin watershed
2. Fairness to all people and sectors (accountability for the public good)
3. Water use and water quality impacts
4. Effective citizen involvement in decision making
5. Consequences (e.g. affordability).

team 2 - water quality

This team noted that the provincial government is already doing much to manage water quality effectively, but that a strategic approach would be needed in the future. They noted the need for the water strategy to address the following decisions.

The team identified a wide range of actions the provincial government should consider as answers to the above strategic questions. These options are noted in the team report. The following suggestions illustrate the team's thinking:

- Expand emphasis on watershed planning and aquifer planning
- Regulate "best management practices" for non-point sources
- Do not allow development without a surface and groundwater assessment study (in the context of the watershed management plan)
- Adopt a vision of zero discharge of toxins and contaminants at point sources for stakeholders to strive toward
- Put a price on water with revenue dedicated to improving water quality (could be through rebates and refunds)
- Raise the existing standards for effluents in the future, giving water users sufficient time to innovate ways to achieve the new standards.(this requires a transparent standard setting process)
- Ensure that the provincial government has sufficient resources for monitoring and enforcement
- Research water quality conditions, causes and solutions.

team 3 - drinking water

This team examined whether the provincial government needs to address specific issues related to drinking water safety in municipalities or for users of private water sources. They concluded that there is a need for significant changes to ensure Albertans are not exposed to unsafe drinking water.

Strategic Decision Needed

Urgent Requirements

1. There must be a common comprehensive definition of "safe drinking water." This will become a key reference in designing means to keep water "safe."
2. The provincial government must reassess the current allocation method (FITFIR) to ensure that all Albertans have adequate supplies of water for basic needs (drinking and sanitation) and are not at risk during times of scarcity.
3. The roles of the provincial government, regional health authorities, municipalities and other stakeholders will have to be more clearly defined.

Framework

Multiple barriers are needed to keep contaminants from consumers. Examples of barriers include: management of source, conservation, treatment, security, distribution system management, priority of rights, monitoring and response, research and development and education of the user.

municipal systems

The team addressed the challenge of ensuring safe drinking water in municipalities smaller than the six largest cities in Alberta. Currently, it is a challenge to meet high standards while keeping costs within reason.

The following options are listed in priority order.

1. **Increase provincial support to municipal supply systems, such as:**
   - Providing technical advice, guidelines and standards
   - Providing financial support related to cost
   - Providing certification programs (all operators/inspectors must be trained and certified)
   - Clearly defining the roles and responsibilities of the provincial government, regional health authorities and stakeholders
   - Re-assessing the parameters for water testing
   - Provincial government/regional health authorities monitor quality and safety of water at small treatment plants

- Monitor against bio-terrorism (use of closed systems that are easiest to monitor)
- Enhanced monitoring system/real time process control.

2. **Use full cost accounting to determine cost and benefit of drinking water treatment:**
   - "Full cost" includes costs of failing to ensure safe water
   - Review provincial grants system to align it with more than one funding source, including non-provincial government sources
   - Tie provincial grants to water metering requirements (graduated pricing above a base amount; consider low income family subsidies).

3. **Support regional management systems:**
   - In more disperse locations, remote monitoring approaches, linking a network of smaller facilities, which share trained staff and a single monitoring location will be the preferred approach
   - In more centralized locations, the provincial government should help municipal partners develop regional water systems with large treatment plants, pipelines, etc.
   - Consider public-private partnerships.

4. **Maintain/upgrade/monitor treatment and distribution technology and infrastructure (cost)**

5. **Fund research and development that support technology development and transfer (green technologies, increased efficiency)**

private water systems

The team identified the following options (listed in priority order) for addressing concerns about drinking water safety in private water systems.

1. **Provincial government/partners provide access to supply of treated water to rural residences where feasible (including pipelines, treat at site of use, etc.)**

2. **Provincial government/regional health authorities monitor and enforce quality and safety of drinking water supply:**
   - Need increased resources and training; preventative indicators, strengthen emergency response protocol/system, communication
   - Consistent/regular testing of supply (provision by provincial government of testing, technical support).

3. **Education/awareness program to private systems regarding the need to treat water (especially surface water) before drinking (provincial government, regional health authorities, etc.)**

4. **Need clearly defined roles and responsibilities for provincial government/ regional health authorities/stakeholders**

5. **Need watershed and source protection policy and framework**

team 4 - aquatic ecosystems

This team addressed public concerns that aquatic ecosystems may be harmed by human use of water as the provincial economy continues to grow. They proposed an increased priority on protection of aquatic ecosystems, noting the following strategic direction.

The team described a number of options the provincial government should consider to protect the aquatic ecosystem. These options are based on an increased emphasis on watershed management plans. Within this setting, the team felt that the provincial government should define a "healthy ecosystem" and should issue "State of the Basin" reports on a regular basis so people develop a better understanding of the conditions and changes within their watershed.

Their highest priority was placed on stakeholder involvement in planning, and on public communication of watershed trends. The team also supported increased research, communication and guidelines to ensure the aquatic ecosystem is protected. Specifically, they suggested the following:

1. **Watershed management plans:**
   - Complete plans for all seven major watersheds; integrate with land use plans
   - Develop common indicators to allow comparison of trends in the water basins (e.g. water quality, biodiversity, water quantity, wetlands, rivers, lakes, riparian health and groundwater)
   - Develop basin-specific indicators to provide a basis for long-term monitoring and status reporting.

2. **Manage demand and supply as a balance:**
   - Set thresholds for maintaining ecological health (consider cumulative effects when setting thresholds)
   - Improve technology to reduce demand
   - Identify sensitive aquatic environments and their requirements and protect natural storage capabilities at the headwaters
   - Utilize full cost accounting (identify ecosystem functions and build the benefits of these functions–and the cost of losing them–into economic assessments of projects).

3. **Define a healthy aquatic ecosystem:**
   - Define the ecological functions for aquatic and riparian habitats, and groundwater
   - Correlate these functions with water quantity, quality and other measurable indicators.

4. **State of the basin reports:**
   - Regular reports that keep the public informed of the condition of their watershed and identify longer-term trends within the basin; these reports would also note provincial progress reports on the watershed management plan.

5. **Awareness:**
   - Develop and distribute curriculum materials that address Alberta basins and aquatic environments
   - Encourage and support arm's length awareness and education programs (e.g. Alberta Lake Management Society, Cows and Fish Program)
   - Help residents understand what watershed they live in and how their watershed is affected by their activities.

6. **Define maximum amounts of substances that a river or lake can accept without causing harm**

team 5 - water supply

This team examined the provincial government's role in water supply and concluded that strategic management in this area is needed.

These three ideas were examined in greater detail:

Supply forecast and demand management could include:

- Trend lines for supply and demand
- Expand the current surface and groundwater monitoring
- Better define sustainability of groundwater supply
- Proactive public consultation.

Where scarcities, exist:

- Store water to meet minimum demand levels
- Establish guiding values and priorities for consumption
- Limited approval for inter-basin transfer based on environmental acceptability
- Locate demand where supply is.

Consider closed diversion of domestic water, when necessary:

- Establish a basin authority and management plan to guide decisions
- Must have agreement between supply basin and receiving basin authorities.

team 6 - water and its role in the economy

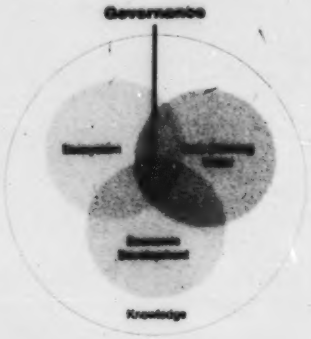
This team examined concerns that the relationship between water supply and economic demand may be unsustainable in some portions of the provincial government. They noted the need for the following strategic decisions.

The team proposed a wide range of options for the provincial government to consider, including the following:

- Develop a new water management regime that establishes common requirements and measures for all users; accurately measure return flows and net consumption to more accurately manage water (withdrawal information is not enough); establish measures for good performance to stimulate best practice
- Develop a risk management framework for responding to fluctuations in supply
- Establish the role of economic tools in re-allocation of rights
- Integrate the many resource planning strategies that affect watershed priorities to ensure consistency in water management
- Develop a body that will share information among sectors and develop an integrated, cooperative approach - this should be tied to watershed management plans and should be accompanied by a change in provincial government organization that reduces silo mentality
- Employ a systems-based approach in setting objectives and policy
- Use economic tools and incentives (user and polluter charges, credits for conservation, etc.) to stimulate changes among users
- Identify and remove current disincentives and institutional barriers to sustainable and most productive water uses
- Determine what existing rights are included in existing water licences
- Explore how priority trading can be used to accommodate existing water licence rights while also allowing the allocations to evolve towards a "best use" approach
- Study inter-basin transfers in order to clarify whether they have a role in some situations
- Encourage partnership and collaboration to improve projects and to combine several projects in order to reduce overall impact and gain efficiency.

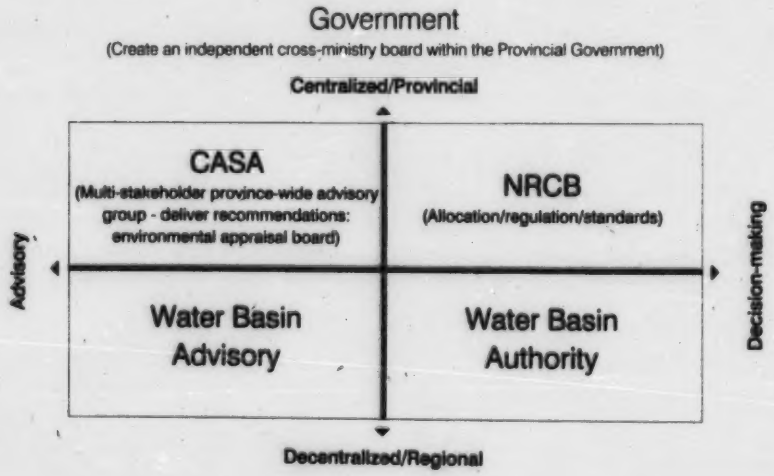
team 7 - governance

This team was asked to consider how water management should be governed, given that many Albertans expect more local decisions and more involvement. They began by noting that governance was the "glue" that held the four water strategy objectives together.



They identified the following questions that must be addressed in a water strategy.

The team identified a model illustrating the range of localization that can be considered, and the range of delegation. In the following figure, the lower half describes governance options at the regional level, while the upper half describes "centralized" options. Bodies can be either advisory (left side) or decision-making (right side).



This model pointed out the need for a variety of governance approaches that are compatible and can work together. While there is benefit in delegating responsibility, the provincial government must retain the ultimate authority for water management and must oversee all water decisions. The provincial government acts as a facilitator of water decisions, a promoter of the outcomes and as a guarantor. The provincial government delegates decision-making and management of services to regional and local levels, when there is benefit in doing so.

The team noted that the expansion of river basin plans to include all major basins in the provincial government was essential to good governance, and also noted that public/private partnerships would play an expanded role.

governance options

Provincial Authority

Create an integrated decision making board within the provincial government to respond to water issues. Could be like the Natural Resources Conservation Board (NRCB).

Provincial Advisory Group

Create an advisory group that addresses water issues provincially and makes recommendations, but has no power over implementation.

Water Basin Councils (Advisory)

Create councils in each basin that address water issues and make recommendations, but have no power over implementation.

Water Basin Authorities

Empower authorities in each water basin to make decisions and oversee implementation of water management